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Combat Crew

strategic air command

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JANUARY 1983

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STRATEGIC AIR COMMAND

GOALS
FOR
'83

Show Our... PRIDE

P ROMOTE THE PRINCIPLES OF OUR PROFESSION--A COMMITMENT TO EXCELLENCE BY ALL PERSONNEL.

R EINFORCE OUR DETERRENT STRENGTH THROUGH FORCE MODERNIZATION AND CONSTANT READINESS.

I MPROVE OUR EFFECTIVENESS THROUGH TRAINING PROGRAMS THAT MEET THE NEEDS OF A QUALITY FORCE.

D EDICATE OURSELVES TO THE UPGRADE OF SAC's FACILITIES IN ORDER TO IMPROVE PRODUCTIVITY AND QUALITY OF LIFE.

E NCOURAGE EFFICIENCIES AND ECONOMIES -- MAXIMIZE MISSION CAPABILITY WHILE STRIVING TO MINIMIZE COST.

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The overriding goal of the Strategic Air Command is deterrence, the avoidance of war by maintaining the requisite military strength to convince any adversary that the costs far outweigh any possible gains from initiating a conflict. While we must never lose sight of this *"big picture,"* I believe it is also important that we establish more specific goals that will enable us to successfully accomplish our primary mission. This is the reason I have established five fairly specific goals for each of us within SAC to strive for during 1983. Before I cover what SAC's goals are for 1983, it is important to first explain why I have chosen the theme **"SHOW OUR PRIDE"** to reflect these goals.

The acronym PRIDE, Professional Results in Daily Efforts, is something that has been associated with SAC for as long as I can remember. However, over the years, for whatever reasons, it has lost some of its significance; in fact, some within SAC may not even be aware of what **PRIDE** represents.

The time has come for us to reflect upon what the word pride means as well as what the acronym **PRIDE** signifies. Webster defines pride as the proper respect for oneself; sense of one's own dignity and worth; self-respect, delight or satisfaction in one's own or another's achievements.

Over the last couple of years, we have witnessed

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General B. L. Davis SAC Commander in Chief

a renewed sense of pride by the general public toward the military profession. This has been evidenced by the surge of strong support for the military and increased national defense. A substantial amount of dollars is being put on the line for both equipment and people. The overriding objective is to increase and improve the combat effectiveness of our all volunteer force while resurfacing the prestige, dignity and pride that has characterized the military profession over the years.

For those of us wearing the uniform today, it is our responsibility to see that we continue to foster and maintain that pride, nurture it and pass it on to those who will follow us. I can think of no better way to do this than by living by the ideals embodied in Professional Results in Daily Efforts. This is the reason I have selected **PRIDE** as an appropriate acronym to explain SAC's goals for 1983.

These goals do not represent anything new for SAC, they have been our standard for years. What they do represent is our continued commitment toward building a stronger, more dedicated, professional and better equipped force; and they require your personal involvement. The Strategic Air Command, charged with responsibilities central to the very survival of our country, can afford nothing less. ★★★★

Combat Crew

Magazine of the Strategic Air Command · 32nd Year of Publication

GEN. BENNIE L. DAVIS
COMMANDER IN CHIEF, SAC

BRIG. GEN JACK K. FARRIS
Inspector General

COL. RICHARD A. PATRICK
Director of Safety

STAFF

Editor
Capt. Randy Lauterbach

Associate Editor
Ken Maassen

Art Editor
Sgt Steve Parrish

Editorial Assistant
M. J. Abboud

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GOALS FOR '83

ON OUR COVER

Show Our PRIDE in '83!

SACRP 127-1 **VOL.XXXIII** **No. 1** **JAN. 83**

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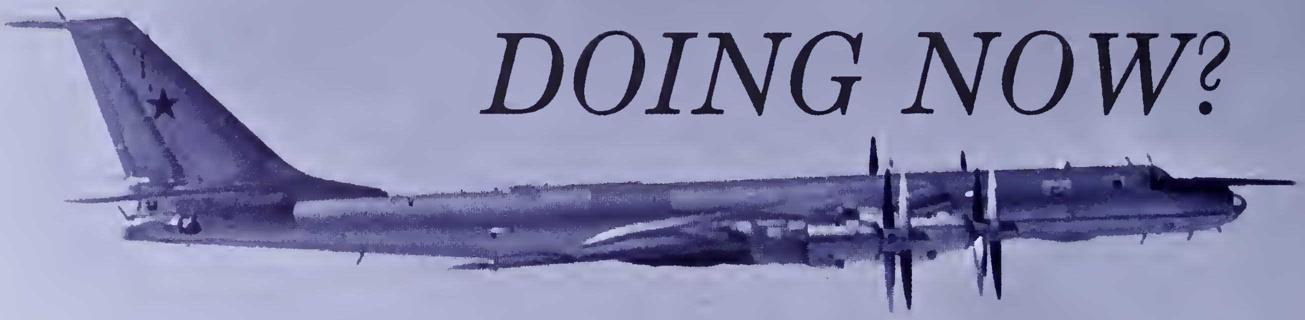
DEPARTMENT OF THE AIR FORCE

WHAT ARE "THEY" DOING NOW?



1Lt Jeff Bauer
28th BMS, Robins AFB

The question would enter my mind at odd times; in those quiet moments between celestial shots on Overland Northeast, as I got hopelessly lost in the T-45 simulator, or as I enjoyed a Saturday in San Francisco. While I was at Mather AFB learning the navigation business, *what were my Soviet counterparts doing?*

Did they have their own Overland No-Show which started in Kiev and stretched across the rolling featureless steppes to the Uzbek Republic and back? Was the Soviet version of the T-45 as dreadful as our own? What did *"they"* do for recreation? Did the students at the Voroshilovgrad Higher Military Aviation School gather at their Officer's Club on Friday for JOC night? Was there a Napa Valley or Tahoe tucked away in the Caucausus mountains? Just what kind of training environment did Soviet navigation students experience?

The thought occurred to me often enough that I finally decided to look into the matter, and hence, this article. In the next few paragraphs we are going to examine how Russian youth enter their Air Force, of what their training consists, and where it leads. As a general summary it can be stated that the entry process is very selective, the training is intense, and it produces very effective officer-aviators.

To begin, it must be remembered that things are different in the Soviet Union. Soviet youth are required to take at least two years of military training in high school. Besides, there are various voluntary youth organizations which teach paramilitary subjects from grade school through college, and these organizations enjoy widespread participation by Soviet youth. In short, most of them have had some military experience prior to applying for formal military training.

However, professional Air Force training normally begins by entry into one of the 15 four-year institutions known as Higher Aviation Schools. To say the selection process is highly competitive understates the situation. Viktor Belenko *(Soviet pilot who defected to Japan in 1976 with his MIG-25)* was one of a group of 360 applicants who were selected from a pool of 4000 hopeful applicants (and this final 4000 applications had been gleened from a still much larger number). Selection is based on academic achievement, political reliability, and competitive examinations. Candidates can be from the civilian sector, but preference is given to servicemen. Their ages usually range from 17 to 21, but servicemen are accepted up to the age of 23.

Belenko had joined the DOSASF *(Voluntary Society for Assistance to the Army, Air Force, and Navy).* This is a paramilitary organization not unlike the Air National Guard, which offers initial flight training. In order to join, Belenko had moved 380 miles from his home to the city of Omsk. In addition to a fulltime job *(and later on medical studies)* his evenings were filled with classes on aerodynamics, navigation, aircraft design, electronics, and meteorology. When he was finally offered a chance *(not a place, just a chance at a place in flight school)* he was forced to resign from medical school and prepare for the exams and physical fitness tests.

The Higher Aviation Schools are roughly comparable to American military academies. Discipline is severe and the pace is demanding. Classes are conducted from September to April. Cadets attend lectures, engage in seminars, do research papers, and participate in *"voluntary"* scientific, military, technical, and political groups. In an average year a cadet can expect to complete 950 hours of academic instruction and 300 hours of drill.

Belenko describes a typical day at school. "Classes started at 7:30 a.m., after breakfast and inspection, and continued until 7:30 p.m., six days a week. On Sunday morning they swabbed, swept, and dusted all crannies of the barracks: then a political officer treated them to a two-hour dissertation about current events."

Among the more than 50 subjects studied were the following:

higher mathematics; military pedagogy and psychology; aircraft design and engines; geometry; theoretical mechanics; radio engineering; principles of scientific-communism; probability theory; physics; chemistry; air force tactics; aerodynamics; political economy.

With regard to Marxism-Leninism, it must be underscored that great emphasis is given to social science courses dealing with the study of communism. The importance of proper ideological development and political reliability cannot be overstated. They are absolute requirements of Soviet officership. Belenko relates time and time again how every world event, every action of the Soviet government and all doctrine was rationalized in terms of Marxist-Leninist principles. An unbelievable amount of time and energy was squandered in this way.

Each school also has a field program. From April through September, cadets receive intensive flight instruction as well as periodic tours with active military units.

Basic flight training is done in either the Czech-made L-29 or L-39 trainer. The course consists of hours of simulator work, classroom instruction, and 50-60 hours of flying. Navigation students receive additional training in the AN-12/CUB, a transport aircraft which has been converted into a flying classroom. From there they specialize and upgrade in aircraft such as the IL-28/BEAGLE, TU-16/BADGER, or TU-95/BEAR.

A cadet accumulates about 360 hours of flight time by graduation. The dropout rate is estimated at about 33 percent, mostly for medical reasons or an inability to master flying techniques. *(There are few washouts for academic deficiencies or disciplinary reasons.)* Of the 360 students in Belenko's class, 258 graduated. Those who successfully complete the training are given the rank of lieutenant and are issued a diploma of navigator-engineer. It is the stated goal of the Soviet military schools to commission officers who are prepared to perform their duties immediately upon being initially assigned to a unit.

Social life is somewhat limited under such a program, but as would be expected, the students find ways to get away from the routine, and, at least, some of the areas are quite nice. Belenko describes the area near the Armavir Red Banner Higher Military Aviation School. The city of Armavir is described as *"... an old city with cobble-stoned streets, trees, flowers, and a number of colorful prerevolutionary buildings that has withstood war and social change. Among the 200,000 inhabitants were substantial numbers of indomitable Armenians and Georgians and an abnormal proportion of pretty girls, many of whom attended a nursing school or teacher's college."* The countryside surrounding Armavir was a plush agricultural area *"with fields of green wheat, blooming orchards, and vineyards."* As a matter of fact, every year of Belenko's cadet training was interrupted as the entire cadet corps was impressed into the *"battle for the harvest."* For several weeks each year cadets and officers alike were packed into buses or trucks and shipped out to the fields. Yet Belenko describes this more as a holiday as the cadets were able to get away from the closed classrooms to sunshine and warm fall temperatures. Besides there were always girls present from the nursing and teaching colleges, so many social contacts were made during this time.

Another benefit of aviation training are travel vouchers on Aeroflot. Students do receive weekend passes, leave, and most official holidays off and for a few rubles cadets can go anywhere in the Soviet Union.

As stated earlier, upon arrival at a combat unit, new lieutenants are officially considered combat-ready, but, in reality, it is at these operational units that the new officers acquire combat skills. They are assigned to experienced aviators who supervise their training closely. This initial training takes five to six months.

The instruction includes study of the particular aircraft design, its weapons, special equipment, and its use in combat. Mastery of the material is checked by written exams. Additionally, extensive use is made of various simulators with special attention given to working through exercises involving emergency conditions.

A typical day at Belenko's first base went something like this:

"They arose at 4:00 a.m. for a bountiful breakfast, then flew two or three times breaking for a second breakfast around 9:30 a.m. The main meal at noon ... was followed by a nap of an hour or so. They attended classes from early afternoon until early evening ... Passes were issued on Saturday nights

Soviet TU-16/BADGER.

and Sundays; unless they were called to clean factories or work in the fields on weekends, requests which occurred roughly every other week."

Finally, after the initial qualification period, personnel undergo yearly checkouts on trainers, in the aircraft, as well as taking exams. Additionally, individual and group competitions are used extensively in conjunction with readiness exercises to insure combat efficiency.

It can be seen that the Soviet aviator is subjected to almost five years of constant instructor surveillance before they enter the privileged world of Soviet military aviation. It is a demanding regimen which takes its toll. On the other hand, the young Russian flyer has enormous incentive to succeed for the successful aviation student is entitled to benefits and a lifestyle which sets him above the vast majority of Soviet citizens. For example, Soviet doctors receive 120-130 rubles per month, a teacher receives 100, but an aviator earns over 300 rubles per month. In a country where housing is at a premium, they are guaranteed an apartment *"with both a bath and a kitchen,"* wherever they are stationed. Their income is not eaten up by food bills as they are entitled to four free meals a day, seven days a week. Ordinary citizens receive two weeks vacation a year, an aviator gets 45 days. The Soviet officer can retire at age 40 on two-third's of his pay. In addition they are entitled to free medical care, uniforms, shoes, besides the recognition and prestige of being a Soviet Officer-Aviator.

In conclusion it can be seen that the selection process is highly competitive, the training rigorous and thorough, and the rewards make it well worth the effort. The Soviet aviator we see today is very capable, loyal, highly motivated, and flies machines that are not significantly inferior to our own. However, none of this information should either surprise or discourage us. They are good, but so are we, and knowledge of their capabilities should only serve as a stimulus for us to become better at what we do.

"Their" navigators train in the AN-12/CUB.

Soviet IL-28/BEAGLE escorted by a Navy F-4.

SYSTEM MANAGEMENT OF THE MINUTEMAN MISSILE

Connie Smith and Luccinda Schuff
Hill AFB Public Affairs

Flying high above the Utah plateau a Strategic Air Command aircraft sends a radio signal to Hill AFB.

Antennas on a missile site within sight of the Great Salt Lake pick up the signal and trigger a simulated launch of the United States' number one deterrent force, the Minuteman missile.

Although the missile doesn't actually fly, the launch systems respond as they would in any of the one thousand Minuteman silos located throughout the northern and midwestern United States. This allows the test engineers at Ogden ALC to check out the complex systems without taking an actual missile off its constant alert status.

As the Air Force system manager for the entire Minuteman ICBM system, the Directorate of Materiel Management at Ogden ALC operates two missile silos with associated launch facilities at the Utah base. Each site simulates exactly the field emplacements except that the missiles in the Utah silos do not contain fuel, nor do they carry warheads.

The monthly SAC overflight is conducted to duplicate the action necessary if the Minuteman could be launched from the ground in event of war.

It is one of many tests conducted in the silos and launch control centers at the Hill Engineering Test Facility, the only Minuteman ground test facility in existence. A part of the directorate's Engineering Division at the Ogden ALC, the facility fulfills vital testing and training missions for the deterrent system.

Sam Jackson, manager of one of the test beds for the missile system, said the testing conducted at Hill falls into two categories: hardware used in the physical makeup of the missile and launch facilities, and software including computer programs for all aspects of the missile's guidance and control systems. *"We're the only place that can test hardware and software changes before they go into the field,"* he said.

"Minuteman is a relatively old system so many of the hardware parts are wearing out," he explained.

Replacements for these parts are installed on a missile in one of the two test silos before actually being incorporated into the system. Mr Jackson said these are often prototypes of the replacements and engineering models. Occasionally hardware parts from operational missiles are brought in for study in the controlled environment.

Cont. on pg. 26

Whirling full circle second by second, the giant radar dish of the AN/FSS-7 near the beaches of Tampa Bay sweeps its electronic beam ceaselessly across sea and sky, and over the Florida peninsula.

And matching it turn for turn, around the face of two scopes in a darkened room nearby, thin lines of blue light stretch out ground clutter and clouds in smears of white and pinpoint ships and aircraft in tiny blobs of brilliance.

But these are of no interest to the automatic radar system or the Air Force men who monitor it day and night.

The beam and the men look for only one target — submarine-launched missiles climbing above the horizon where sky and ocean meet.

With other sentinels on America's coast, Det 1 mounts a constant search of this country's seaward approaches to warn the nation and its retaliatory forces of an attack by Soviet ballistic missile submarines — if it should ever come.

WELCOME TO DET 1

SUBMITTED BY
Lt Roscoe L. Griffin
20 MWS
MacDill AFB

The network, called the Sea-Launched Ballistic Missile (SLBM) Detection and Warning System, is filling in a critical defense gap created by the growth of Russia's attack submarine forces now armed with hundreds of missile launchers.

Purpose of the warning net, part of the North American Air Defense Command (NORAD), is to provide the reaction time necessary to fire retaliation missiles and launch bombers and fighters before they can be destroyed by incoming warheads.

Whereas the United States once depended on up to 25 minutes warning of an intercontinental ballistic missile attack over the Arctic, Soviet submarines patrolling off the east and west coasts have cut the warning time considerably — to perhaps seven minutes or less.

The alert net is thus considered a particularly vital part of the U.S. defense system, even though attacking sea missiles could not be knocked out, because it would assure massive retaliation and give pause to any aggressor.

At MacDill AFB 50 officers and airmen are involved in the direct operation and maintenance of this warning system on a 24-hour-a-day basis. A minimum of two radar technicians, one computer technician, a space systems technician and a space system director are on duty at all times at MacDill.

With the big radar dish spinning inside the pressurized 45-foot dome (or "bubble") nearby, operations personnel watch the primary scope — with a second scope as backup — while the electronic beam searches hundreds of miles to sea and waits for an echo answer.

But not just any echo. The radar system — converted from antibomber defenses, with increased power and sensitivity — is discreet to the point where it will ignore all targets that do not act as incoming missiles rising above the seaward horizon.

Heart of the system is the computer, which constantly analyzes the seaward return from the radar in automatic search.

Unless a target meets the initial criteria of an attacking missile — position, speed, angle of climb, direction, etc. — the searching radar will keep spinning full circle. A jet fighter speeding inland, for example, would be disregarded.

But the instant the computer decides missile criteria are met, the big dish stops its 360-degree whirl, shaking the building with a grinding shudder, and locks on to the target with quick, lateral swings.

Simultaneously, crewmen monitoring the scopes know from the narrow fanning movement of the radar scan that a possible target has been acquired. They are also warned by a system of flashing red lights and loud beep signals.

As the radar goes into a tracking mode, bouncing a fusillade of electronic hits and returns off the target so the computer can refine its assessment, communications are opened with the NORAD missile warning center.

Primary communications are automatic, with the data fed almost instantly to the missile warning officer at Cheyenne Mountain as the assessment continues.

Monitoring crewmen can also open a direct hotline to NORAD to backstop the automatic feature of the communications system with a voice relay of events.

Within seconds, the computer of the eight million dollar radar decides if the target is an incoming missile. If so, the finale would be an SLBM alert, with calculation of the launch point and impact area so NORAD could warn the military agencies and national decision-making authorities while sea and air defense forces race for the launch area.

If the determination is made the object is not an incoming missile, the radar system would return to its revolving search mode and scan the seaward horizon for other possible launches.

At that point, the crewmen in the TOR (Tactical Operations Room), continue to monitor their equipment and breathe a little easier — for the moment.

DO YOU AGREE?

WELL, YEA...
BUT...
WAIT...
IF...
NO....
O.K....
I GUESS...
BUT...
WHY NOT...
O.K....

Lt Col James C. Milliron
508th SMS, Whiteman AFB

My observations in the missile procedures trainer lead me to conclude that the most common term used by missile combat crewmembers is the question, *"Do you agree?"* When a problem is presented for evaluation, the commander, busting to make the CPO time, quickly outlines his course of action and asks the deputy *"Do you agree?"* The question is often dead serious and sometimes provokes wild preliminary discussion before his deputy shouts back *"No!"* It is more disconcerting to encounter the pregnant pause, the verbal zero, while the deputy attempts to digest and evaluate the proposed action. It is most disconcerting when, under pressure, the deputy agrees for the sake of proceeding and his doubts are later confirmed in the critique.

The purpose is to eliminate the emphatic *"No's,"* the pregnant *"pauses,"* and the panic *"Yes's"* which interfere with good crew coordination. In my judgment, the MPT is the wrong place to broach the question of agreement between crewmembers. The superior crew has already discussed the problems they might face under evaluation and has agreed on who does what and when. Both members already know that the answer to *"Do you agree?"* will be an affirmative *"Yes"* and these phrases are springboards to positive action. Possible stumbling blocks become routine procedure.

Why strive to make your actions routine? Let me advance this simple equation for your consideration. **MPT time – Routine actions = Think time.** The objective is to condense the time required for routine actions by eliminating the uncertainty, discussion and pause which often occurs, thereby making think time as big a portion as possible for the MPT period. Why give yourself more think time? Think time can be used to attack the unusual twists which come your way, such as weapon system safety rules, codes, emergencies and security, and to review weapon system status. Many crewmembers would agree that a big contributor to the error rate is the unawareness of weapon system status.

How does a crew make their actions routine? I have some suggestions. First, perform on alert as though you were under evaluation. Use the T.O. for every demand-response procedure. Refer to SACR 207-16 for every LF entry and exit and every security situation. Secondly, practice crew coordination on alert. Get to know how your partner sees and approaches alert problems, even if it means cutting back on your rest time to participate with him during busy periods. Third, take time to simulate those problems which do not occur daily. Discuss the lead-ins, cautions, warnings, and notes so that you both know their content and meaning before it becomes necessary to apply them. Make the routine truly routine.

This short theory has been derived from MPT observations. Instructors and evaluators make the same observations. They know, without doubt, who develops and practices good crew coordination on alert and who waits for their MPT ride to make some discovery about their tech data and about themselves. Try my suggestions. I guarantee you better MPT performance.

Do you Agree?

UP IN

Capt Norland C. Hoefer,
341st SMW, Malmstrom AFB

The industrial empire of this great nation produces a vast amount of hazardous materials daily. It is estimated that over 200,000 bulk shipments of acids, corrosives, gases, insecticides, petroleum products and other hazardous articles are made in the United States daily. That equates to approximately one out of every ten trucks rolling toward you on the highway today carries explosives, flammables or poisons. Many of these items are used in manufacturing processes which produce the material things that we all like to buy and own. Still others can be used directly by the consumer whether it be you, the business down the street, or the military. The remaining hazardous items are just plain waste products which must be hauled off for proper disposal.

If left to fate, the proper mixture of the right two or more hazardous substances could produce a very large explosion with everything around going up in smoke killing people and damaging property. A panel of safety experts has estimated that a single truck explosion on a crowded street could kill 5,000 people. A ship mishap in a port city like New York or San Francisco could injure 30,000 individuals. Probably all of us at one time or another have read or heard about some kind of disaster involving a truck, train or even a plane that went up in smoke because of improper packaging of one or more of these hazardous materials.

In an attempt to reduce mishaps caused by careless handling of hazardous materials, the Department of Transportation, through the Office of Hazardous Materials, has established and published federal regulations which govern shipments of hazardous materials. These requirements are spelled out in CFR 49, which covers shipments by air, surface and water. In addition, AFR 71-4 specifies requirements for airlift of hazardous materials within the military environment. Both regulations set up requirements for the proper packaging, marking, labeling and certification of each kind of hazardous item offered for shipment. They further specify compatibility grouping and placarding when combining different hazard classes into a single shipment.

In the past, many violations of these requirements occurred causing serious mishaps. Congress delegated to the Department of Transportation the authority to enforce their regulations. So the Office of Enforcement was created with field inspectors checking for compliance. Shippers who are found in violation of the requirements can be levied a civil fine of up to $10,000. A shipper who causes any damage to property or injury because of a violation is subject to criminal penalties of up to $25,000 and/or up to five years imprisonment.

The military is probably one of the larger consumers of hazardous materials in the nation. Consider all the different kinds of bombs, warheads, missiles, ammunitions, propellants, chemicals and petroleum products used to support the various weapon systems. In fact, the Department of Defense is the world's largest shipper of hazardous materials in the world. It is very important that everyone that handles or offers hazardous materials for shipment do his part not only to protect the resource we have in the military environment, but also to protect the transportation system of our country.

BOMB COMP 82

Pease's 509th Bomb Wing became the first SAC unit to win five Bomb Comp trophies and thus walked away with the Bombing and Navigation Competition honors at Barksdale AFB in November.

The previous record for the Bombing and Navigation Competition had been four trophies and had been set in1981 by — you guessed it — the 509th.

The FB-111 and KC-135 unit from New Hampshire was not only named champion of the annual SAC meet, *they also took home the Mathis Trophy, the Saunders Trophy, the John C. Meyer Memorial Trophy, and the Navigation Trophy.*

Pease crews achieved the highest competition effectiveness of .7535 to capture the coveted **Fairchild.** Runner-up for the trophy was the 416th Bomb Wing, Griffiss AFB, with a CE of .7323. The 5th Bomb Wing from Minot AFB came in third by obtaining a CE of .7181.

The Fairchild Trophy is awarded to the SAC wing with the best combined bombing and navigation team score for both bombers and tankers. It is named in honor of Gen Muir S. Fairchild, WWI bomber pilot and vice chief of staff of the Air Force.

The Mathis Trophy, awarded to the Best Bomber unit, and based on total points compiled in bombing, was presented to the 509th Bomb Wing, Pease AFB. First and second runner-ups for the trophy were the 416th Bomb Wing, Griffiss AFB and the 5th Bomb Wing, Minot AFB. The Mathis Trophy honors Lt Jack Mathis who heroically died at his bombsight in a WWII raid over Germany.

The Saunders Trophy was awarded to the 509th Bomb Wing, Pease AFB. The 509th attained the most points in all phases of tanker operation. The Saunders

Members of Pease's 509th Bomb Wing gather around the many trophies they took home from the 1982 SAC Bombing and Navigation Competition.

is given in honor of Brig Gen Don W. Saunders, former commander of the 57th Air Division, who was killed attempting to set a world cruise record aboard a KC-135 in 1958.

Coming in second and third for the Saunders were the 319th Bomb Wing, Grand Forks AFB and the 22d Air Refueling Wing, March AFB.

Competition for the **Lt Gen James H. Doolittle Trophy** was extremely close, with the 15th Air Force edging out 8th Air Force.

The Fifteenth collected 74.61% of possible points, just 1.45% ahead of the 8th Air Force. The trophy is in honor of "Jimmy" Doolittle who prior to WWII had won nearly every flying trophy in the world.

The John C. Meyer Memorial Trophy for best F/FB-111 unit in low level bombing and electric countermeasure was won by the 509th Bomb Wing, Pease. First runner-up for the award was the 380th Bomb Wing, Plattsburgh AFB. General Meyer was the SAC commander in chief from 1972 through 1974.

The 5th Bomb Wing, Minot AFB, won the **William J. Crumm Linebacker Memorial Trophy.** The 416th Bomb Wing, Griffiss AFB, claimed second place, followed by the 379th Bomb Wing, Wurtsmith AFB.

The Crumm Trophy is awarded to the B-52 unit that compiles the most points in high altitude bombing. The trophy is named in honor of Maj Gen Crumm, former commander of SAC's Third Air Division who was killed in a B-52 crash in Southeast Asia.

5th Bomb Wing members display their win: the William J. Crumm Linebacker Memorial Trophy.

The Gen Russell E. Dougherty Short Range Attack Missile Trophy was won by the 42d Bomb Wing, Loring AFB. The trophy is in honor of Gen Dougherty, commander in chief of SAC from 1974 to 1977. The trophy was presented to the B-52 or FB-111 unit achieving the best overall SRAM results in the competition. First runner-up for the SRAM award was the 379th from Wurtsmith AFB. Second runner-up was the 5th Bomb Wing, Minot AFB.

42d Bomb Wing competitors display their win, the Russell E. Dougherty SRAM Trophy.

Winning the **Gen Curtis E. LeMay Bombing Trophy** was the 380th Bomb Wing from Plattsburgh AFB. The LeMay Trophy was awarded to the bomber crew compiling the most points in high and low level bombing. Second place was the 416th Bomb Wing from Griffiss. In third place was the 5th Bomb Wing from Minot. The trophy is named in honor of the early SAC commander and former Air Force chief of staff.

The Navigation Trophy was awarded to the 509th Bomb Wing from Pease, with second place going to the 319th Bomb Wing, Grand Forks AFB. Third went to the 410th Bomb Wing from K. I. Sawyer AFB. The Navigation Trophy is awarded to the tanker unit compiling the most points by their crews in celestial navigation.

The Maj James M. Bartsch Electronic Warfare Trophy was won by the 319th Bomb Wing from Grand Forks AFB. First runner-up for the ECM trophy was the 42d Bomb Wing, Loring, and second runner-up was the 410th Bomb Wing of K. I. Sawyer AFB.

The ECM trophy is in honor of Maj Bartsch who was one of the most decorated electronic warfare officers in the Air Force. Maj Bartsch died in an aircraft accident in 1977. The trophy is presented to the B-52 unit that achieves the best overall electronic warfare results in the competition.

319th Bomb Wing winners with the James F. Bartsch Trophy.

Two new trophies added to the 1982 SAC Bombing and Navigation Competition truly reflect the essence of the annual competition — bombing and navigation.

The **Gen John D. Ryan B-52 Trophy** and the **James S. McDonald — Donald W. Douglas Sr. KC-10 Trophy** join other honors presented to winning aircrews and units.

The Ryan Trophy was awarded to the B-52 unit achieving the most points on bombing competition missions for high and low level altitude bombing. Scoring includes evaluation of time control (release timing) and 20 simulated bomb releases. Winning this prestigious trophy was the 416th Bomb Wing from Griffiss AFB. The 5th Bomb Wing, Minot AFB, garnered first runner-up while the 410th Bomb Wing from K. I. Sawyer took third place.

416th Bomb Wing winners with one of the two new trophies added to the SAC Bomb Comp: the Ryan Trophy.

The KC-10 Trophy was awarded to the KC-10 team that compiled the most points on five inertial navigation exercises. Each exercise is scored for position and time control accuracy — simulating a rendezvous with the receiver aircraft at precisely the right place and time. The 2d Bomb Wing from Barksdale was the first winner of this trophy.

The Best Crew Awards were won by the following crews and units:

Best B-52. First: *Crew S-26, commanded by Capt Stephen L. Brooks, 5th Bomb Wing, Minot.*

Second: *Crew E-34, commanded by Capt Roy M. Mattson, 416th Bomb Wing, Griffiss.*

Third: *Crew E-24, commanded by Capt Michael J. Van Velzer, 320th Bomb Wing, Mather.*

Best FB-111. First: *Crew E-73, commanded by Maj William C. Brooks, 380th Bomb Wing, Plattsburgh.*

Second: *Crew S-03, commanded by Capt Leon Casaubon, 509th Bomb Wing, Pease.*

Best F-111 (RAAF). First: *Team A-1, RAAF Base Amberley.*

Second: *Team A-2, also from Amberley.*

Best KC-135. First: *Crew S-121, commanded by Capt David W. Roberts, from 509th Bomb Wing, Pease.*

Second: *Crew S-102, commanded by Capt Dennis B. Parkhurst, 22d ARW, March.*

Third: *Crew S-101, commanded by Maj Paul M. Breen, 509th Bomb Wing, Pease.*

Best KC-10. First: *Crew E-232, commanded by Capt Fred Lange, 2d Bomb Wing, Barksdale.*

Second: *Crew E-278, commanded by Maj Jon Mickley, 2d Bomb Wing, Barksdale.*

A new trophy presented at the Bomb Comp, the McDonnell-Douglas KC-10 Trophy was presented to 2d Bomb Wing crewmembers.

Photos were taken by:
SrA Scott Orback
A1C Kevin Davidson
AB Willie Thornton

CFIC CORNER

CMSgt Jerry J. Ammons
93d BMW
Castle AFB

LET’S NOT GET IT TOGETHER

When a mishap occurs during air refueling, how often do we think, *“How dumb?”* Is it really dumb, or is it just that all involved failed to pay full attention to what they were doing?

Air refueling, as we all know, can be very dangerous. Because we do it every day, it becomes a normal operation and very commonplace. This can cause us to fall into a trap. Air refueling requires full coordination, full attention, and above all, full crew involvement. You must always be alert and know the exact position of the other aircraft. If at any time you become unsure of what the other guy is doing during air refueling or if he becomes erratic in the envelope, get some separation and call a breakaway.

Stop the surprises during air refueling. Coordinate with the receiver/tanker concerning track, times, altitudes, A/R freqs, offload and training requirements. How many times have you been upset when you arrive at the refueling area and find out you don’t have the time to do what you would like to do? What happens when you are expecting 10,000 pounds more fuel than the tanker will give you? How many times have you, as a tanker pilot, wanted some autopilot off training and the receiver informs you he is on a SACR 60-4 check and doesn’t want to do this? Just think how upset these things make you. Could that be an invitation to a mishap?

When you are flying in cell, keep the leader informed. He cannot be an effective leader if he doesn’t know the requirements and have a plan for the cell. Why not take a few minutes on mission planning day and visit or call your counterpart to coordinate the requirements for the air refueling? Doing this will prevent being surprised at the ARCP the next day.

How many crewmembers are really current on the procedures for air refueling? The refueling is a means to an end for the receiver but very essential to the mission accomplishment. (You can’t *hit* the target if you *hit* the tanker first.) The tanker crews are the A/R experts, but the receiver crews must also know the rules. If you are a qualified boom operator, are you prepared to call a breakaway before the receiver gets into the structural parts of the tanker? Receiver pilot, how many times have you called a breakaway? Why do you depend on the boom operator to decide if a breakaway is necessary? As a receiver pilot, do you know the boom limits for your type aircraft? What do the pilot director lights tell you? How many fighter pilots know that their upper limit is 25 degrees elevation, and at this point they will not get a red pilot director light to direct them down?

Let’s not forget the navigators. How many of you are ready to jump in there and save a rendezvous if things don’t go right? Are you aware of

what equipment the receiver aircraft has to effect the rendezvous? What about radios? Do you know how many the receiver has? Are you sure of how much time there is from the IP to the CP? The point to be made is: How much do you know about tech order procedures? As qualified crewmembers it is our responsibility to know all the procedures and follow them.

Look at the experience level of our crewmembers. In the past few years we seem to be getting very young crewmembers in all positions. We have new boom operators who have very few hours in the airplane, and there are receiver pilots who are equally new in their airplane. It is not expected that these people will know everything, but we do expect them to follow the tech data for their airplane. How much practice do the crewmembers now get?

We find that the hours spent in actually flying and refueling are constantly going down. Because of this, we should make every minute count. If the receiver pilot does not have a range time or a low level time to meet, stick around awhile and give the boom operator a few extra contacts. This will increase his proficiency and also yours. It is a fact that the majority of the air refueling mishaps occur when the airplanes are being flown by qualified crewmembers. So you can see, it is vitally important that even the experienced crewmembers talk to each other. Tell the boom operator if he is too close to the canopy. Tell the receiver if he is consistently high in the envelope.

The maneuvers that are demonstrated at the Central Flight Instructor Course of the Strategic Air Command are all designed to make the new instructors aware of how to accomplish air refueling in the safest, smoothest, most professional manner possible. They show how smooth a refueling can be if properly coordinated and properly flown. Some of the maneuvers that are demonstrated at CFIC are the turns and altitude changes, i.e., the WIFF, boom effects on the tanker and receiver, the effects of small power changes by both the receiver and tanker, and a demonstration which is called the 300 foot closure.

The WIFF shows how a receiver can safely stay in the refueling envelope if the tanker maintains a smooth platform, even though the tanker is turning and changing altitude. The effects of the boom on the tanker/receiver can be clearly demonstrated by the boom operator. This demonstrates how he can actually cause the receiver to drop back by raising the boom and how he can have the tanker "back" into the receiver by lowering the boom. The power changes that are demonstrated show how much effect a small power change can have on the ability of the receiver to stay within the envelope.

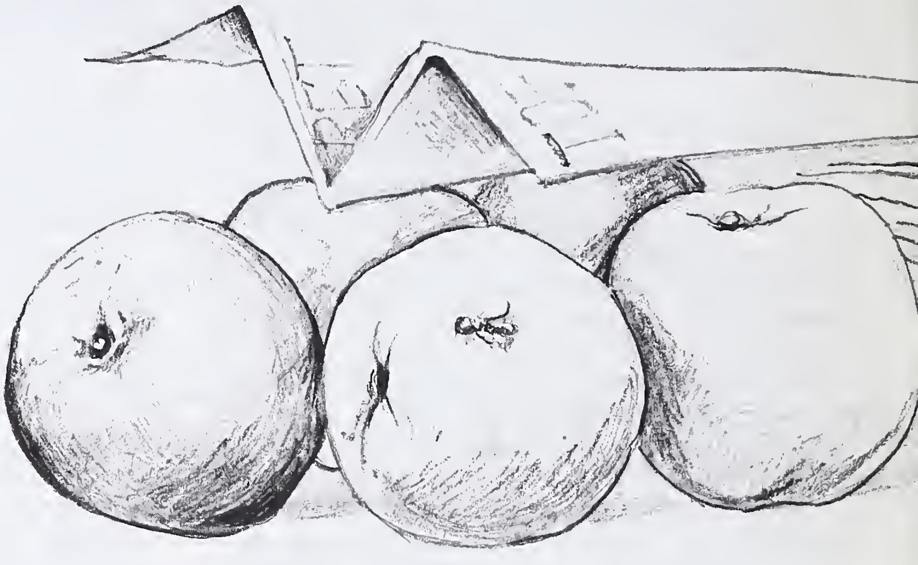
One of the most dramatic CFIC demonstrations is the 300 foot closure. In this one, the receiver is in trail with the tanker approximately 300 feet ahead. The tanker pilot then reduces the airspeed by three to five knots. It takes the receiver about one minute and 15 seconds to move from 300 to 200 feet. It then takes about 40 seconds for him to close from 200 to 100 feet. From 100 feet to where the receiver would contact the tanker is only 15 seconds. Unless a breakaway is called and appropriate action is taken by the receiver there would be no way to avoid a midair collision. This one demonstration shows that a large receiver aircraft has so much forward momentum that it is not able to stop with power reduction alone.

It is possible that a mishap involving a B-52 and a KC-135 was caused by this very type of closure. All of the maneuvers demonstrated at CFIC are for the sole purpose of showing what can happen during the air refueling operation. Under no circumstances should they be performed away from a controlled environment.

Mishaps don't just happen. They are frequently caused by lack of attention or lack of communication. Seldom are mishaps caused by inability. Knowledge is the key. Know your aircraft limits, know the tech data, and know your limitations. Work toward being a professional and strive always for an accident-free refueling. Remember that you are the key to prevention of accidents, and only you can prevent them.

Fly the aircraft!

MISSILE EWO INSTRUCTOR: WHAT A DEAL!



Captain John A Shafer
3901st SMES
Vandenberg AFB

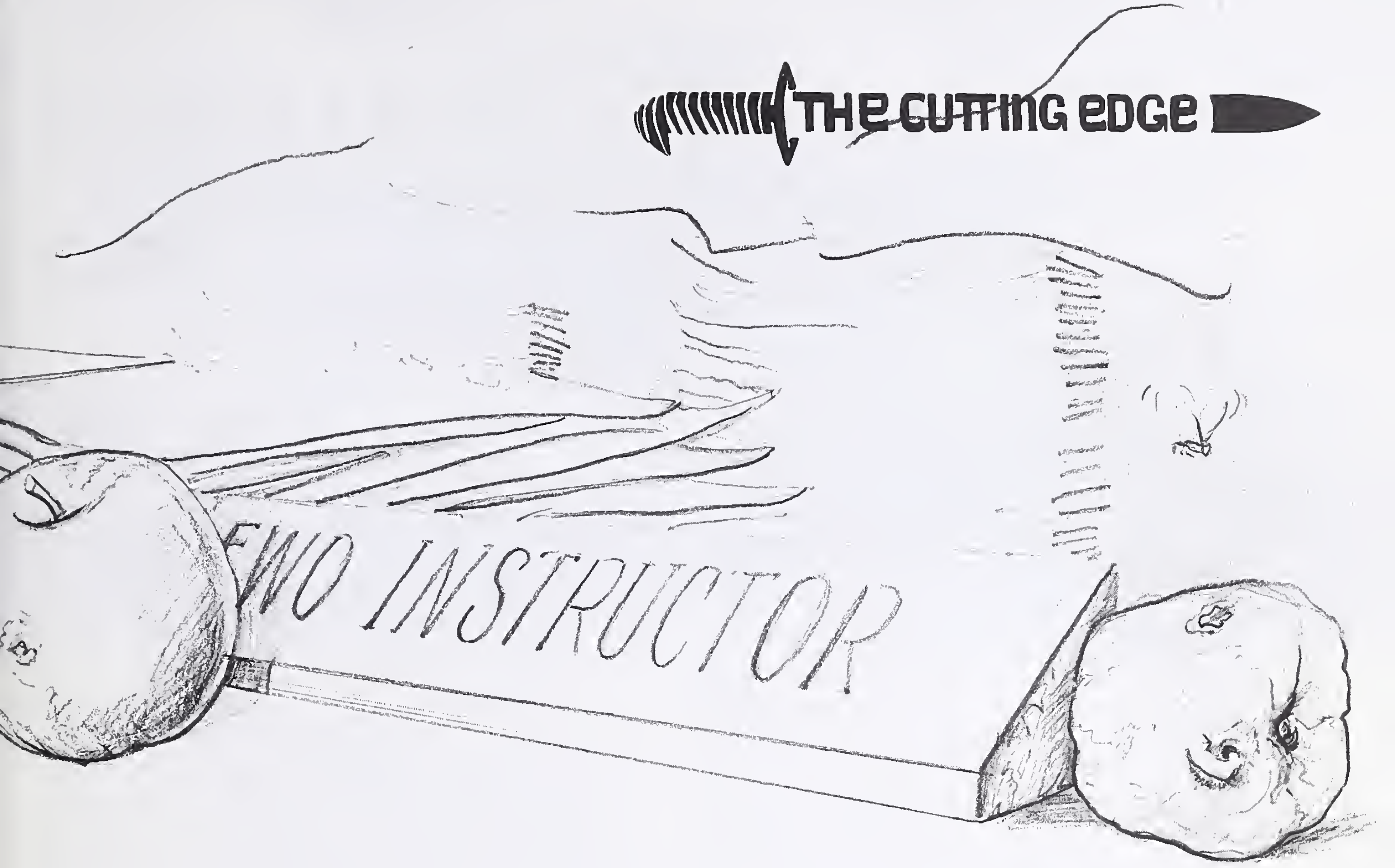
"How in the world do you get to be an EWO instructor? *Those guys have it made: no alerts, teach a few classes, write some tests; what a deal!"*

As a crewmember, I made similar comments, and as an Emergency War Order instructor, I heard them more than once. As a former crewmember and EWO instructor in the Titan and Minuteman systems, I'd like to offer some insight into what missile EWO instructors actually do.

The job of an EWO instructor is somewhat deceiving. I'd estimate that an EWO instructor spends only about 25 percent of his time actually instructing, while the remainder is spent assimilating, interpreting, developing and disseminating the information that you as a crewmember must know. This information comes from a myriad of sources. At last count, there are over 26 regulations which must be reviewed to construct your unit's EWO Master Lesson Plan. In addition, cryptographic documents plus a wide variety of miscellaneous classified materials must also be referenced. The Master Lesson Plan, which is required by regulation and is the source from which the major portion of your EWO conceptual training emanates, typically comprises over 100 pages of top secret material.

The EWO checklists alone are derived from at least three source documents. Information must be transferred from these documents to the checklist formats which are then reproduced. A typical unit usually requires a 9,000 page top secret reproduction run for each EWO revision. Subsequently, crewmembers must be trained in the use of the checklists covering both real-world and exercise situations. The process of extracting, formatting and disseminating this information is extremely time consuming and requires extraordinary attention to detail. One slip or misprint, and the integrity of the SIOP could be in doubt.

Dissemination of EWO information is accomplished through classroom and individual instruction, missile procedures trainer scripts and self-study packages. In view of the vast amount of material that crewmembers are required to know, it is imperative that they regularly review relevant regulations on their own. Being able to correctly



implement EWO procedures is to a great extent a self-taught skill. Studies have shown that the average student remembers about 25 to 30 percent of what he hears in a classroom environment. Even if you're twice as good as the average, that means only about 60 percent of your classroom training is remembered — not good enough for our profession. Clearly, EWO instructors can, at best, only provide you with basic knowledge. It is up to you to develop your proficiency and to hone those skills necessary to carry out your primary responsibilities.

EWO instructors traditionally and by regulation have other duties in addition to developing master lesson plans and checklists and instructing crewmembers. They provide specialized EWO training to your wing's staff officers, command post controllers and missile procedures trainer operators. EWO instructors also serve as the unit's Positive Control custodians, and Titan instructors perform code custodian duties. In addition, EWO instructors usually serve as advisors to your unit's primary and alternate battle staffs during exercises and actual battle staff operations.

If you want to get into the *"good deal"* world of the EWO instructor, the most important attributes to develop are a willingness to accept change, attention to detail and the resolution to forge ahead with your product regardless of its perishability. You must continue to produce a perfect product while coping with extremely short suspenses and periods of tremendous workloads. And let's not forget that all-important ability to communicate. Every EWO class day, you must provide the expertise and clear instruction that those crewmembers expect of you.

EWO is undoubtedly the most dynamic facet of the missileer's world; it changes frequently and sometimes without much warning. It is up to your EWO instructors to assimilate and disseminate this material. It is up to you to make sure that you understand your EWO entirely. As is noted at the beginning of all SAC missile EWO regulations: "In critical areas involving release or withhold of nuclear weapons, there is no room for incomplete knowledge or substandard performance."

POTENTIAL FLIGHT HAZARDS

You Can Make the Difference

BiG

Capt Rhett T. Cooper
1CEVG, Barksdale AFB

There are many potentially hazardous problems that we could encounter during any flight regardless of how simple or complex the mission. Some hazards are obvious and some not so obvious. The question is whether or not we know all the pilot actions required when one of these flight hazards is encountered. Let's take a look at a few subjects and see just how much we know about our job and associated responsibilities.

Pilot Weather Report (PIREP) — Whenever ceilings are at or below 5,000 feet, visibility at or below five miles, or thunderstorms are reported or forecast, FAA facilities are required to solicit and collect PIREPs which describe conditions aloft. Pilots are urged to cooperate and volunteer reports of cloud tops, upper cloud layers, thunderstorms, ice, turbulence, strong winds, and other significant flight condition information. Such conditions observed between weather reporting stations are vitally needed. The PIREPs should be given to the FAA ground facility with which communication is established, i.e., FSS, ARTCC, or terminal ATC facility. In addition to complete PIREPs, pilots can materially help round out the in-flight weather picture by adding to routine positions reports, both VFR and IFR, the type of aircraft and the following phrases as appropriate:

ON TOP
BELOW OVERCAST
WEATHER CLEAR
MODERATE (or HEAVY) ICING
LIGHT, MODERATE, SEVERE, EXTREME TURBULENCE
FREEZING RAIN (or DRIZZLE)
THUNDERSTORMS (location)
BETWEEN LAYERS
ON INSTRUMENTS
ON AND OFF INSTRUMENTS.

If you are unable to make PIREPs by radio, reporting upon landing of the in-flight conditions encountered to the nearest FSS or Weather Service Office will be helpful. Some of the uses made of these reports are:

1. Used by ATC to expedite the flow of air traffic in the vicinity of an airport.
2. Used by ARTCC to expedite the flow of en route traffic and determine most favorable altitudes.
3. Used by FSS to brief other pilots.

By the way, when giving a PIREP, a critical item often left out of the reports is *Clear Air Turbulence* **(CAT)** conditions. CAT has become a very serious operational factor to flight operations at all levels and especially to jet traffic flying in excess of 15,000 feet. The best available information on this phenomena *must* come from pilots via the PIREP reporting procedures.All pilots encountering CAT conditions are urgently requested to report time, location and intensity of the element to the FAA facility with which they are maintaining radio contact.

PIREPs are the best way to help fellow pilots on their *"safe way"* home. When giving a PIREP always include enough information to adequately portray weather conditions encountered while at the same time being clear and concise during the radio transmission. A PIREP format guide and other meteorological information, can be found in the Flight Information Handbook. If possible, review the PIREP guide prior to initiating your radio transmission. Most importantly though, get the information out in a timely manner. Thirty minutes from now may be too late to help that fellow pilot.

Personal Checklist — Aircraft accident statistics show that pilots should be conducting a preflight checklist on themselves as well as their aircraft, for pilot impairment contributes to many more accidents than failures of aircraft systems. A personal checklist can be easily committed to memory and covers the more common categories of pilot impairment.

I'm physically and mentally safe to fly — not being impaired by:

ILLNESS
MEDICATION
STRESS
ALCOHOL
FATIGUE
EMOTION

Simply put, when it comes time to fly and the body doesn't seem just right stay on the ground. This is one aspect of the mission where only you can help.

Alertness — Be alert at all times, especially when the weather is good. Most of us pay attention to business when operating in full IFR weather conditions, but strangely, air collisions almost invariably have oc-

cured under ideal weather conditions. Unlimited visibility appears to encourage a sense of security which is not at all justified. A very important time during the mission to be fully alert is when operating in the terminal area. We can help *"keep it safe"* during this critical phase of flight by maintaining a close *"listening watch"* "on the radios. Considerable information of value may be obtained by listening to advisories being issued in the terminal area, even though controller workload may prevent a pilot from obtaining individual service.

Bird Hazards/Migratory Patterns —Believe it or not, our governing directives give specific guidance for pilot actions when we sight large flocks of birds. We are requested to contact the nearest FAA ARTCC, FSS, or tower when we observe large flocks of birds and report the:

Geographic location,
Bird species (if known),
Approximate number,
Altitude,
Direction of bird flight path.

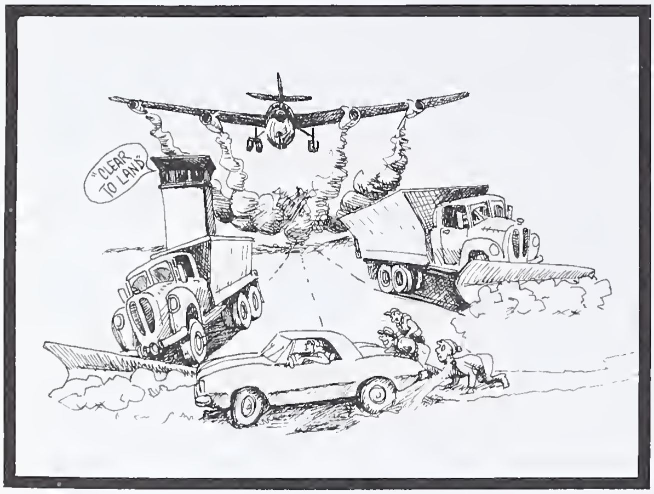
It seems there is always one more requirement for us to fulfill. However, these *"feathered friends"* can and do present a hazard to flight. The birds considered of greatest potential hazard to aircraft because of size, abundance, or habit of flying in dense flocks are the whistling swans, Canadian geese, blue geese, snow geese, white-fronted geese, mallards, pintails, gulls, vultures, starlings and blackbirds. To most laymen, that covers about every kind of bird known to man. But the point is, there are a number of species that can play havoc with the air machine. Perhaps we should find out what type(s) of species inhabit our local flying areas. Most of the species mentioned above are considered particularly hazardous during spring and fall migrations and when they are concentrating in wintering areas. Swans can make nonstop flights of several hundred miles (Chesapeake Bay to Lake Erie) at altitudes up to 6,000 feet. At some airports, there are large flocks of sandpipers, horned larks, blackbirds, tree swallows, longspurs, white pelicans, sandhill cranes, or other species which can be a hazardous problem during certain seasons. Notices of airports which have been reported to the FAA as having high density bird populations are published in the Notice to Airman (class II) publication until they can be transferred to the remarks section of the Airport Facility Directory.

One other point to note here concerns migrating waterfowl. Since these birds tend to dive when closely approached by aircraft, pilots are warned not to fly directly under migrating flocks of swans, geese or ducks. Unfortunately, complete date is not available for the U.S. concerning the migration paths of all species, or the exact times of migration, or the altitudes at which these birds fly, or the effects of weather on migration. Keep in mind we are requested to report bird strikes on FAA Form 5200-7, Bird Strike/Incident report Form. The data and information derived from these reports will be used to develop standards to cope with this expensive hazard to aircraft and for habitat control methods adjacent to airports.

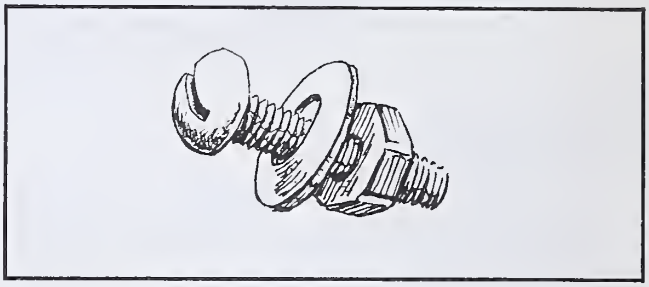
You've probably been wondering two things while reading this article. One, where or what is the source for this information and; two, are all of these pilot requirements for real. **Yes** they are for **real** and you can find these requirements and much more information in the Airman's Information Manual, (AIM). If you've never looked through this valuable document, now is the time. After all, the more we know about our job and associated responsibilities the sooner we can help ourselves and others avoid those *"Potential Flight Hazards."*

Ops Hazards

✱ A-135 was cleared to land at a civilian airfield. Touchdown was normal, power was retarded to idle and the speed brakes were raised. The copilot then noticed an automobile and two snow plows on the runway. He immediately directed the pilot to "Go Around!" as he raised the flaps to 30 degrees. The pilot rotated 100 feet short of the vehicles to complete another successful touch and go. What happened? The tower operator was never notified of the vehicles on the runway. Needless to say, the flight crew never got the word either. Remember "cleared to land" means cleared to land but it does not insure the runway is clear. Eyeballs are still the crewmember's best survival tools.



✱ After one hour of flight on a B-52 training sortie, the copilot noticed a hole in the number seven engine upper cowling. The pilots determined the hole had been caused by fire and shut down the engine. The crew returned to base, burned fuel down to landing weight and accomplished an uneventful seven engine approach and landing. At no time did the crew observe any erratic or unusual instrument indications or feel any vibrations. Investigation revealed that the strap holding the number seven combustion chamber had failed and a crack then developed in the fuel manifold. This allowed the fuel to torch and burn through the cowling.

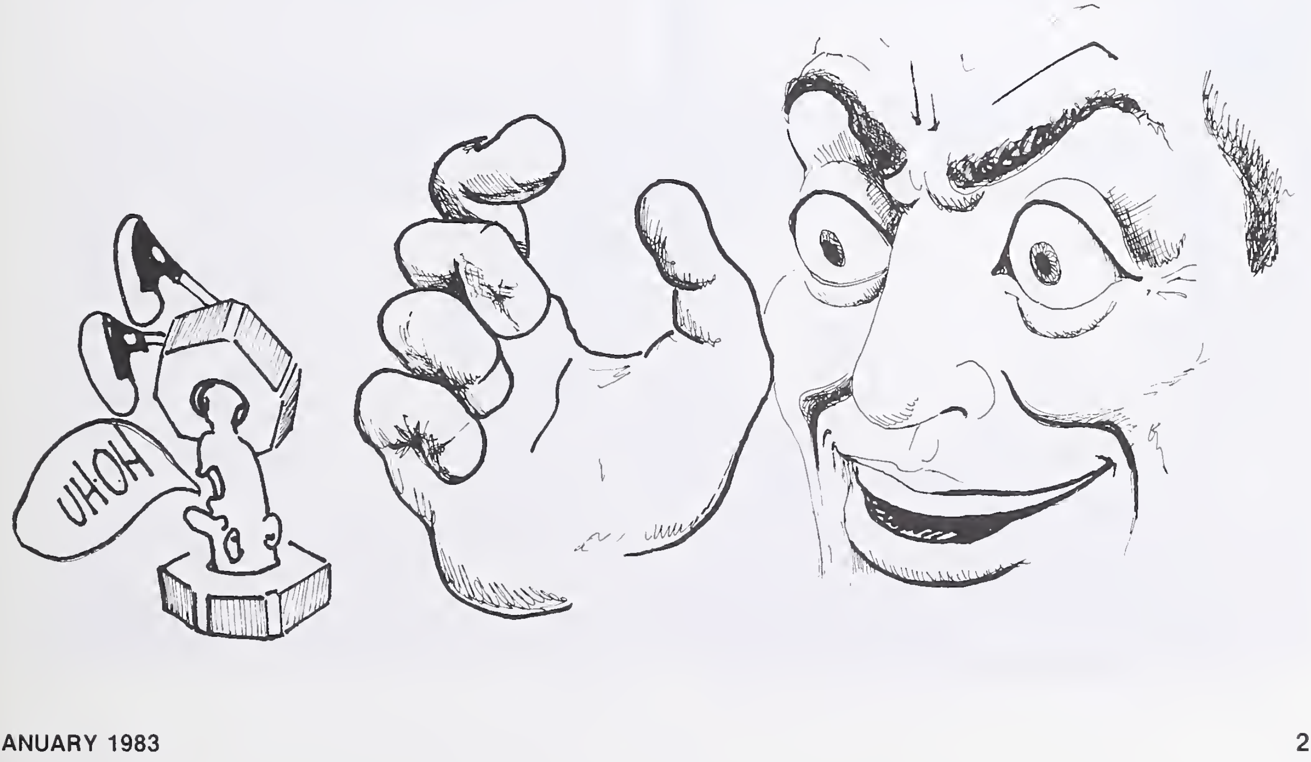


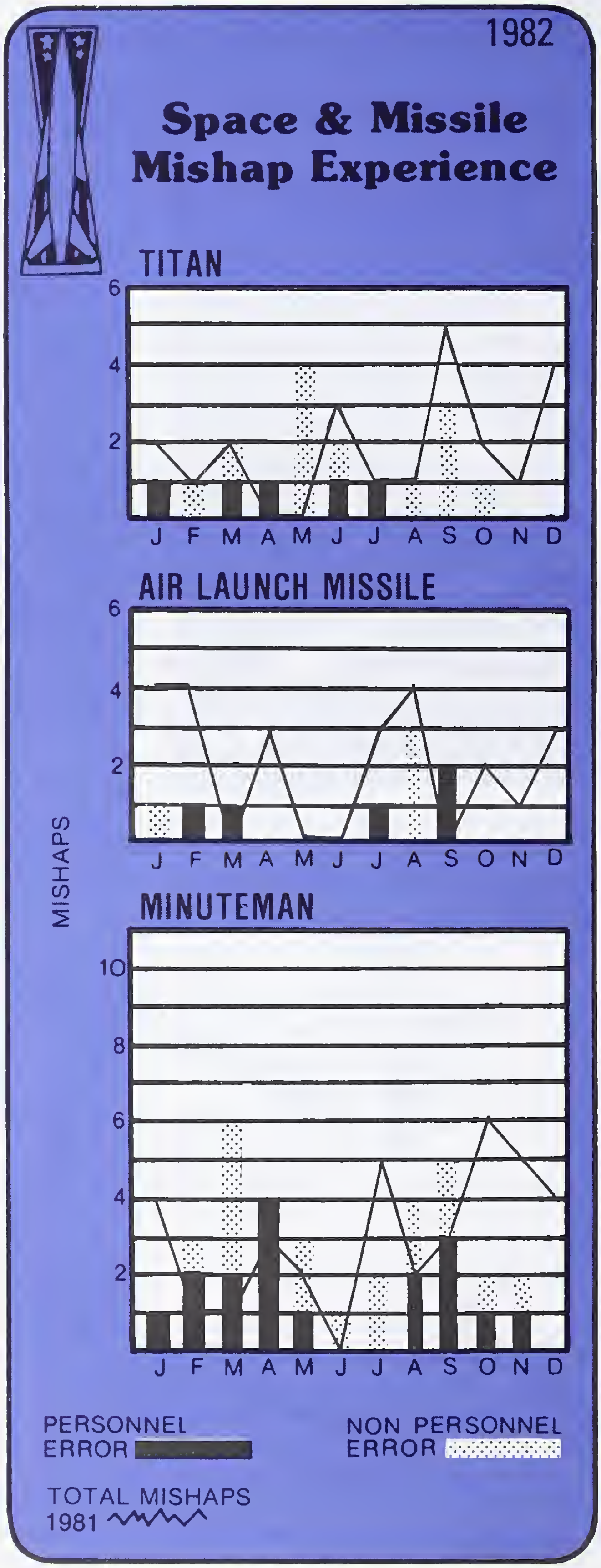
✱ A B-52 pilot was unable to move the control column. The elevator had been driven to a full up position with the control column becoming very stiff to move and then it finally became immobile. The aircraft was diverted to a base with a longer runway. While enroute, chase planes confirmed elevator and trim tab positions. Boeing provided valuable inputs which eventually lead to an uneventful recovery. The culprit was a loose bolt which caused binding in the elevator crank assembly.

✱ A B-52 departed the runway during landing rollout. The mission was normal until the second low level bomb run when the number one hydraulic pack failed to shut down after the Master Bomb Control switch was turned off. The checklist was accomplished during climbout from low level and the right forward main gear was emergency extended. Enroute to home station, the number two hydraulic pack also failed. The aircraft status at high station was number one and two hydraulic packs shut down along with an undetermined standby pump condition. The antiskid circuit breaker was not pulled. The aircrew flew a precision approach to a normal touchdown 1500 feet down the runway. The drag chute failed to deploy when the handle was pulled and the pilot applied the brakes very firmly. Smoke was observed coming from the main gear tires. The aircraft continued down the runway and began drifting to the left. Rudder/crosswind crab were used in an effort to maintain control but the aircraft departed the left side of the runway. The crew reported no injuries but all eight gear and the tail gun turret were damaged.

✱ A B-52 experienced a complete loss of the rudder/elevator hydraulic systems. The first option was to ditch the aircraft and then recover the crew. However, the crew felt they could safely land their stricken aircraft with a flaps-up landing. A Hotel Conference confirmed this. The landing resulted in a high bounce and a subsequent "hard landing." The only other time this had been attempted, the bomber broken up on touchdown and was destroyed. This time there was only a seven foot crack in the fuselage skin near the left wing root.

✱ During air refueling, a RC-135 crew was having difficulty trimming the aircraft. They backed off to increase separation from the tanker and to trouble shoot their system. They soon discovered the stabilizer trim switch was installed upside down. Would a thorough preflight have prevented this problem?



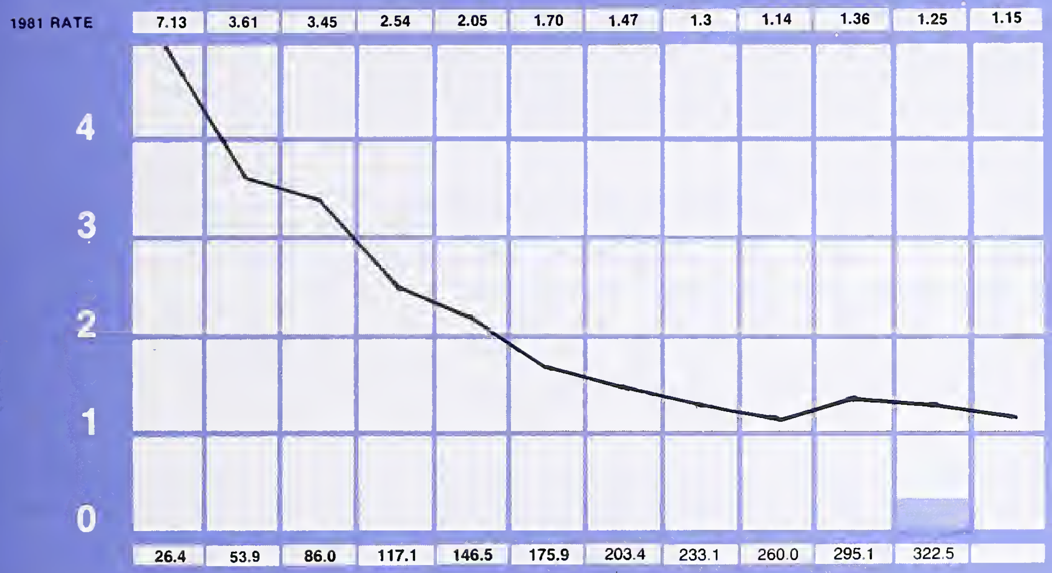


HEADS UP

Maj Timothy C. Lyle was flying transition at the end of a three-hour sortie in the TR-1. At various times during the pattern work the Master Caution Light would illuminate with no accompanying annunciator panel lights. Since this is not necessarily unusual in the U-2R or TR-1 at low altitude while making throttle changes, the patterns were continued. Approaching the base turn for the third visual pattern, as the throttle was retarded to idle, the engine flamed out. Maj Lyle's initial reaction was to execute the bold face for a low altitude airstart, however, low engine rpm ruled out the airstart attempt and he secured the throttle. At the same time he started a turn back toward the field and attempted to raise the flaps from 35 degrees to the maximum recommended position of 20 degrees for a flame out landing. By this time, however, the engine had spooled down too far to produce sufficient hydraulic pressure to move the flap more than a few degrees up. This increased drag further complicated an already critical situation. Despite the fact that his drag was higher than planned and his spacing was wider than that desired for a flame out pattern, Maj Lyle successfully used ground effect to glide the aircraft to the runway and execute a flawless engine out landing. The alert actions and superb flying skill of Maj Lyle resulted in the uneventful recovery of the TR-1 and the saving of a valuable national asset.

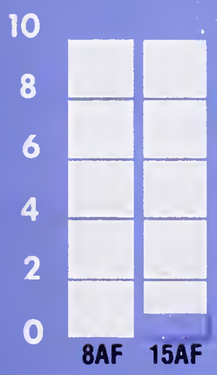
1982 Flying Safety Rate

SAC CLASS A MISHAP RATE (PER 100,000 FLYING HRS)



CUMULATIVE FLYING TIME (1,000 HRS)

MISHAPS	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
1981	2	0	1	0	0	0	0	0	0	1	0	0
1982	0	0	0	0	0	0	0	0	0	0	1	



MISHAP STATUS

+KC-135A	MAR 82
+KC-135A	MAR 82
B-52G	NOV 82

LEGEND ∧ = 1981 RATE (SAC)
+ = ANG
− = AFRES

cont. from pg. 7

SYSTEM MANAGEMENT OF THE MINUTEMAN MISSILE

The test silos, HETF I and HETF II, are designed for Minuteman II and III. They are actual silos in which missiles with inert fuel propellants and without the warheads can be placed for testing.

Missiles placed in the silos are connected, as in the field, to launch control centers which house men and equipment essential to the missile and its launch. However, the LCC capsules at Hill are above ground rather than buried in a protective shell as they are in the field.

HETF handles situations in which *"unique engineering and technical expertise is required to identify the problem and come up with the best possible fix,"* Mr Jackson said. *"When normal maintenance doesn't suffice to solve a problem and correct it,"* he said, *"then we're called in."*

In support of the hardware testing, another facility at nearby Little Mountain is operated to monitor actual hardness and survivability of the missile parts.

Testing of the software for the Minuteman system is done at the launch control centers supporting each of the silos and at the guidance and control laboratory which is set up like an LCC without a missile silo.

"There is quite a bit involved in the computer system," Mr Jackson said. *"Any changes or new software will go through a complete integration testing,"* he said.

"When the software tests are run," he said, *"we go through every conceivable test scenario."*

Major modifications to the Minuteman are brought to HETF for evaluation before final application in the field.

"Once tested, the parts go into production and are sent to the field for site incorporation," Mr Jackson said.

The test site at HETF I can be monitored for damage resulting from an earthquake or a bomb blast. *"Each test missile in the silo can be shaken at different frequencies and amplitudes while the response of the guidance and control is monitored,"* he said.

The test facilities at Ogden ALC support the six Minuteman wings which manage 150 to 200 silos each. He said, *"We're able to test all six Minuteman configurations."*

Hill AFB technicians keep a close watch as a Minuteman II drops into a silo. (USAF Photo by Jeff Shields)

SAC SAFETY SCREEN

These Warriors . . . The Cutting
Edge of The National Resolve

308 SMW, Little Rock Crew R-051: MCCC 1Lt Christopher Maley, DMCCC 1Lt Wesley T Fleming, MSAT SrA Bill Unger, MFT A1C Steve Zimmerman.

341 SMW, Malmstrom Crew R-047: MCCC 1Lt Gregory P Jones, DMCCC 2Lt Stephen P Dehoff

90 SMW, F E Warren Crew R-063: MCCC 1Lt Sherrel D Frandsen, DMCCC Capt Dale A Chapman

91 SMW, Minot Crew R-062: MCCC 1Lt Randy W Hacker, DMCCC 2Lt Michael L Creel

321 SMW, Grand Forks Crew E-095: MCCC 1Lt Thomas P Conner, DMCCC 2Lt Robert E Schultz

381 SMW, McConnell Crew R-073: MCCC 1Lt Anthony L Marshall, DMCCC 1Lt Philip L Robinson Jr, MSAT A1C William V Kershow III, MFT A1C Christopher S Peto

351 SMW, Whiteman Crew E-142: MCCC 1Lt Richard Kane, DMCCC 1Lt William Jones

308 SMW, Little Rock Crew R-052: MCCC 1Lt James Ball, DMCCC Capt Joyce Richardson, MSAT SSgt Gareth Myers, MFT SrA Mark Dietz

90 SMW, F E Warren Crew E-021: MCCC Capt Robert J Hubiak, DMCCC 2Lt William R Bowles

44 SMW, Ellsworth Crew E-111: MCCC Capt Kevin M Ward, DMCCC 2Lt James E Staples

390 SMW, Davis-Monthan Crew R-091: MCCC 1Lt James L Rodgers, DMCCC 2Lt James L Bressette, MSAT A1C Martin J Simko, MFT A1C Eric D West

321 SMW, Grand Forks Crew R-056: MCCC 1Lt Edward A Sekac, DMCCC 1Lt Donald H Jenness

341 SMW, Malmstrom Crew E-063: MCCC 1Lt Stewart G Carr, DMCCC 2Lt David H Nuckles Jr

32 AREFS, Barksdale Crew: P Capt Dennis B Dolle, CP Capt Larry G Boyes, FE TSgt Lee E Swanson, BO SSgt Randall L Lane

71 AREFS, Barksdale Crew R-116: IP Maj William L Rhule II, P Capt Rex A Anderson, NN 1Lt Grover M Trask, BO SSgt William R Mendenhall

62 BMS, Barksdale Crew S-02: P Capt James W Maker, CP 1Lt Mark D Hetherington, RN Capt Ricky W Friesen, NN Capt Craig H F Wilkerson, EW Capt James G McGlashan, AG SSgt Charles H Dean Jr

596 BMS, Barksdale Crew R-61: P Capt Racardo F Caballero, CP Capt Samuel R Dick, RN Capt Richard G Ruth, NN 1Lt Steven P Dickman, EW Capt Michael A Green, AG A1C Benjamin F Dowis III

340 AREFG, Altus Crew E-132: P Capt Phillip W Moudy, CP Lt Jeffrey P Hightaian, N Lt Jett R Taylor, BO SrA Glenn G Houthuysen

7 AREFS, Carswell Crew R-111: AC Capt Clarence J Fennel, CP 1Lt Joel S Smith, N 1Lt Steven M Willard, BO SSgt Cathy A Yandley

The SAC Safety Screen is an honor roll of SAC's most professional crews. To gain listing on the Screen, crew members must be nominated by their unit commanders and meet high selection criteria of experience in their aircraft or missile system *IAW AFR 127-2/SS1*.

UNIVERSITY OF FLORIDA
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HALL OF FAME

FLARE

TACTICAL FLYING

OVER TWENTY-SIX YEARS	
170 AREFG, McGuire (NJANG)	Feb. '56
OVER TWENTY-FOUR YEARS	
171 AREFW, Greater Pittsburgh (PAANG)	Mar. '58
157 AREFG, Pease (NHANG)	Jun '58
OVER TWENTY-THREE YEARS	
940 AREFG, Mather (USAFR)	May '59
307 AREFG, Travis	Sept '59
OVER TWENTY-ONE YEARS	
151 AREFG, Salt Lake City (UTANG)	Feb '61
134 AREFG, McGhee Tyson (TNANG)	Aug '61
OVER TWENTY YEARS	
11 SG, Fairford	Feb '62
340 AREFG, Altus	Jun '62
96 BMW, Dyess	Aug '62
OVER NINETEEN YEARS	
19 BMW, Robins	Aug '63
OVER EIGHTEEN YEARS	
160 AREFG, Rickenbacker (OHANG)	Dec '64
320 BMW, Mather	Jul '65
OVER SIXTEEN YEARS	
452 AREFW, March (USAFR)	Sep '66
OVER FIFTEEN YEARS	
92 BMW, Fairchild	Feb '67
55 SRW, Offutt	Jul '67
2 BMW, Barksdale	Aug '67
OVER THIRTEEN YEARS	
5 BMW, Minot	Feb '69
42 BMW, Loring	Sep '69
141 AREFW, Fairchild (WAANG)	Oct '69
OVER TWELVE YEARS	
28 BMW, Ellsworth	May '70
OVER TEN YEARS	
101 AREFW, Bangor (MEANG)	Mar '72
306 SW, Mildenhall	Apr '72
416 BMW, Griffiss	May '72
305 AREFW, Grissom	Aug '72
OVER NINE YEARS	
379 BMW, Wurtsmith	Apr '73
OVER EIGHT YEARS	
931 AREFG, Grissom (USAFR)	Feb '74
384 AREFW, McConnell	Mar '74
189 AREFG, Little Rock (ARANG)	May '74
43 SW, Andersen	Dec '74
OVER SEVEN YEARS	
68 BMW, Seymour Johnson	Sep '75
OVER FIVE YEARS	
410 BMW, K.I. Sawyer	Apr '77
190 AREFG Forbes (KSANG)	Apr '77
128 AREFG Milwaukee (WIANG)	Jul '77

ICBM

OVER EIGHTEEN YEARS	
1 STRAD, Vandenberg	Sep '64
OVER TWELVE YEARS	
341 SMW, Malmstrom	Apr '70
OVER NINE YEARS	
390 SMW, Davis-Monthan	Jul '73
OVER EIGHT YEARS	
351 SMW, Whiteman	Oct '74
91 SMW, Minot	Nov '74
OVER SIX YEARS	
321 SMW, Grand Forks	Feb '76

To gain listing in the Hall of Fame, a SAC or ARF unit must be Class A mishap-free for 48 months.

*U.S Government Printing Office